

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)

2. (Currently Amended) The communication network designing circuit as set forth in claim [[1]]
3, wherein said path for said multiple point communication service is derived on the basis of a
preliminarily set optimization standard.

3. (Currently Amended) ~~The communication network designing circuit as set forth in claim 1,~~
~~wherein said setting means comprises:~~ A communication network designing circuit for multiple
point communication service for permitting arbitrary communication within a predetermined
range by providing traffic flowing in from an ingress node through which data flows in from
another network and traffic flowing out from an egress node through which data is fed to the
other network, comprising:

setting means for setting a mathematical programming problem for deriving said multiple
point communication service to permit arbitrary communication within the predetermined range,
the setting means comprising:

optimization reference generating means for setting an objective function for
minimizing a link load in an object network coupled to the other network and serving as
an optimization reference and setting a constraint expression for deriving said link load,

[[;]]

~~route selecting condition generating means for generating a constraint expression for selecting a route for including traffic flowing in from the other network;~~
per-user necessary link capacity calculating condition generating means for generating a constraint expression for calculating a necessary link bandwidth for each link carrying traffic flowing in from each ingress node, [[;]] and
link including condition generating means for generating a constraint expression so as not to exceed a link capacity limit in each link; and
optimizing means for solving the mathematical programming problem set by said setting means and obtaining a path for said multiple point communication service.

4. (Currently Amended) The communication network designing circuit as set forth in claim 3, wherein the optimization reference generating means, ~~the route selecting condition generating means;~~ the per-user necessary link capacity calculating condition generating means, and the link including condition generating means operate in parallel with respect to each other.

5. (Canceled)

6. (Currently Amended) The communication network designing method as set forth in claim [[5]] 7, wherein said path for said multiple point communication service is derived on the basis of a preliminarily set optimization standard.

7. (Currently Amended) ~~The communication network designing method as set forth in claim 5,~~
~~wherein said setting comprises:~~ A communication network designing method for multiple point
communication service for permitting arbitrary communication within a predetermined range by
providing traffic flowing in from an ingress node through which data flows in from another
network and traffic flowing out from an egress node through which data is fed to the other
network, comprising:

setting a mathematical programming problem for deriving said multiple point
communication service to provide arbitrary communication within the predetermined range, the
setting comprising:

setting an objective function for minimizing a link load in an object network
operatively coupled to the other network and where the objective function serves as an
optimization reference₁[[;]]

setting a constraint expression for deriving said link load₁[[;]]

~~generating a constraint expression for selecting a route for including traffic~~
~~flowing in from the other network;~~

generating a constraint expression for calculating a necessary link bandwidth of
each link carrying traffic flowing in from each ingress node₁[[;]] and

generating a constraint expression so as not to exceed a link capacity limit in each
link₁[[.]]

solving the mathematical programming problem set by said setting; and
obtaining a path for said multiple point communication service.

8. (Currently Amended) The communication network designing method as set forth in claim 7, wherein the setting an objective function, the setting a constraint expression, ~~the generating a constraint expression for selecting,~~ the generating a constraint expression for calculating, and the generating a constraint expression so as not to exceed a link capacity limit in each link operate in parallel with respect to each other.

9. (Canceled)

10. (Currently Amended) The storage medium as set forth in claim ~~[[9]]~~ 11, further comprising:
deriving said path for said multiple point communication service on the basis of a preliminarily set optimization standard.

11. (Currently Amended) ~~The storage medium as set forth in claim 9, wherein said setting step further comprises:~~ A storage medium storing a communication network design control program for designing a communication network for multiple point communication service for permitting arbitrary communication within a predetermined range by providing traffic flowing in from an ingress node through which data flows in from another network and traffic flowing out from an egress node through which data is fed to the other network, said communication network design control program comprising:

setting a mathematical programming problem for deriving said multiple point communication service to provide arbitrary communication within the predetermined range, the setting comprising:

~~minimizing a link load in cooperation with an objective function that serves as an optimization reference;~~

setting a constraint expression for deriving ~~[[said]]~~ a link load₁[[;]]

generating a constraint expression for selecting a route for ~~[[including]]~~ traffic flowing in from the other network₁[[;]]

generating a constraint expression for calculating a necessary link bandwidth of each link carrying traffic flowing in from each ingress node₁[[;]]

generating a constraint expression so as not to exceed a link capacity limit in each link₁[[.]]

solving the mathematical programming problem set in said setting step; and

obtaining a path for said multiple point communication service.

12. (Currently Amended) The storage medium as set forth in claim 11, wherein ~~the minimizing a link load~~, the setting a constraint expression, the generating a constraint expression for selecting a route, the generating a constraint expression for calculating a necessary link bandwidth, and the generating a constraint expression operate in parallel with respect to each other.

13. (Canceled)

14. (Currently Amended) The transmission medium as set forth in claim ~~[[13]]~~ 15, wherein said communication network design control program operates said computer for obtaining said path for said multiple point communication service on the basis of a preliminarily set optimization

standard.

15. (Currently Amended) ~~The transmission medium as set forth in claim 13, wherein said setting step in said communication network design control program comprises:~~ A transmission medium transmitting a communication network design control program for designing a communication network for multiple point communication service for permitting arbitrary communication within a predetermined range by providing traffic flowing in from an ingress node through which data flows in from an other network and traffic flows out from an egress node through which data is fed to the other network said communication network design control program comprising:

setting a mathematical programming problem for deriving said multiple point communication service to provide arbitrary communication within the predetermined range, the setting comprising:

setting a constraint expression for deriving said link load_i[[;]]

~~generating a constraint expression for selecting a route for including traffic flowing in from the other network;~~

~~operating said computer for generating a constraint expression for calculating a necessary link bandwidth of each link carrying traffic flowing in from each ingress node_i[[;]] and~~

~~operating said computer for generating a constraint expression so as not to exceed a link capacity limit in each link_i[[.]]~~

solving the mathematical programming problem set in said setting; and

obtaining a path for said multiple point communication service.

16. (Currently Amended) The transmission medium as set forth in claim 15, wherein the setting a constraint expression ~~an objective function, the generating a constraint expression~~, the operating said computer for generating a constraint expression for calculating a necessary link bandwidth, and the operating said computer for generating a constraint expression so as not to exceed a link capacity limit in each link operate in parallel with respect to each other.

17. (New) A method for determining traffic capacities for nodes in a network, the method comprising:

specifying a range having a boundary forming an area that includes a plurality of nodes making up the network;

identifying a first one of the plurality of nodes that is proximate to the boundary as an ingress node to make incoming traffic available to other nodes in the network;

identifying a second one of the plurality of nodes that is proximate to the boundary as an egress node to make outgoing traffic from the network available to another network;

identifying an incoming traffic rate for the ingress node;

identifying an outgoing traffic rate for the egress node;

determining paths from the ingress node to the egress node that carry the incoming traffic via at least a subset of the plurality of nodes;

calculating link capacities for the determined paths; and

determining traffic capacities for the at least the subset of the plurality of nodes using the calculated link capacities.

18. (New) The method of claim 17, further comprising:

identifying a third one of the plurality of nodes proximate to the boundary as a second ingress node to make second incoming traffic available to other nodes in the network;

identifying a second incoming traffic rate for the second ingress node;

determining paths from the second ingress node to the egress node that carry the second incoming traffic via certain of the at least the subset of the plurality of nodes;

calculating link capacities for the determined paths from the second ingress node; and

determining traffic capacities for the certain of the at least the subset of the plurality of nodes using the calculated link capacities.